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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,712	03/10/2004	Karsten Heuser	12406-083001 / P2003,0150	5002
26181 7590 03/10/2011 FISH & RICHARDSON P.C. (SV) PO BOX 1022 MINNEAPOLIS, MN 55440-1022				
EXAMINER				
VETTER, ROBERT A				
ART UNIT		PAPER NUMBER		
1712				
NOTIFICATION DATE		DELIVERY MODE		
03/10/2011		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

# Office Action Summary

**Application No.**

10/798,712

**Applicant(s)**

HEUSER ET AL.

**Examiner**

ROBERT VETERE

**Art Unit**

1712

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 4,5,8,9 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6,7,10-15 and 17-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Examiner's Comments***

A response to a non-final rejection was received and entered on 1/10/11. Claims 4,5,8,9 and 16 remain withdrawn pursuant to an election made on 5/27/2008.

### ***Response to Arguments***

1. Applicant's arguments filed 1/10/11 have been fully considered but they are not persuasive.

Applicant first argues that Graff '210 fails to teach that the second ceramic layer is deposited directly on the first ceramic layer. This is not persuasive. While the examiner agrees that Graff '210 teaches a method of deposition wherein inorganic layers are first deposited followed by organic layers (see, e.g., ¶ 0016), Graff '210 further teaches that a forth inorganic layer can be deposited directly onto the third inorganic layer without an intervening organic layer (¶¶ 0017-0018). Additionally, Graff '210 teaches that the plasma treatment which modifies the upper surface of the inorganic layers can be conducted on any of the layers (in this case, the third) (¶ 0017).

Applicant next argues that plasma treating the polymeric substrate would not alter the surface of the ceramic layer. The examiner agrees with this statement. However, the examiner has not taken this position in the rejection.

Applicant also argues that the ceramic treatment described in ¶ 0073 removes contaminants rather than modifying the surface of the layer. This is not persuasive. While ¶ 0073 does state that plasma treatment will remove contaminants, ¶ 0082 also explains that plasma treating the inorganic barrier layer will cause the surface to undergo structural and chemical changes. As applicant has pointed out, ¶ 0082 goes on to state that these changes may improve surface conditions for subsequent deposition of the organic layers. However, as stated above, Graff '210 teaches that this plasma treatment can be performed on the third inorganic layer and a forth inorganic layer is deposited directly onto the third. Thus, Graff '210 teaches that the surface of the third inorganic layer is modified and that a fourth (claimed second) inorganic layer is deposited directly on this layer.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 6, 7, 10-15, 17-26, 28 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Graff et al. (US 2003/0203210).

**Claims 1, 28 and 31:** Graff teaches barrier coatings and methods of making the same.

Specifically, Graff teaches depositing three plies of aluminum oxide onto the substrate, followed by a plasma treatment (i.e. forming a first ceramic barrier layer on a substrate, wherein the first ceramic barrier layer has a first surface and a second surface and the first surface is closer to the substrate than the second surface; forming a second ceramic barrier layer directly on the second surface of the first ceramic

barrier layer) [0088]. A portion of the second surface of the first ceramic barrier layer is modified to introduce first nucleation sites on the second surface via plasma treatment [0065, 0073]. Graff further discloses that the composite structure of the plies of the layers may compensate for unavoidable defects because defects in one ply will generally be blocked by the subsequent overlying ply (inherently, the first ceramic barrier layer and the second ceramic barrier layer together have enhanced barrier capabilities against gas and liquid as compared to similar adjacent ceramic barrier layers formed without the modifying step to introduce nucleation sites ([0079]; [0088]-[0092]; see fig. 3). Graff also explains that the plasma treatment causes the surface of the barrier layer to undergo structural and chemical modifications which improve surface conditions for subsequent deposition (claimed second surface comprises a material different from the first surface) (§ 0082).

**Claims 2-3:** Graff teaches chemical modification by the use of a plasma treatment ([0065], [0073], and [0088]).

**Claims 6-7 and 10-11:** Graff teaches multi-ply barrier layers that may comprise metal nitrides and metal oxides such as titanium oxide and tantalum oxide, (i.e. applying material with a critical nucleus of one molecule) [0043]. Furthermore, as multiple plies are deposited, the very first trace of the metal oxide or nitride hitting the surface of the ceramic barrier layer would inherently form a nucleation promoting material on at least a portion of a previously deposited ceramic layer.

**Claims 12-15 and 17:** Graff teaches forming first and second ceramic barrier layers comprising aluminum oxide and silicon nitride, and may be deposited by chemical vapor deposition ([0043], [0071]).

**Claim 18:** Graff discloses the use of a flexible transparent substrate [0040].

**Claim 19:** Graff teaches modifying at least a portion of the second surface to introduce second nucleation sites on the second surface of the second ceramic barrier layer; and forming a third ceramic barrier layer on the second ceramic barrier layer, wherein the third ceramic barrier layer is inherently initiated at the second nucleation sites ([0023]—[0024]).

**Claims 20-23:** Graff teaches the barrier layers (i.e. first and second ceramic barrier layers) may have a thickness ranging from 50-500 angstrom (i.e. 5-50 nm and within the claimed range) [0021].

**Claims 24-25:** Graff teaches forming an environmentally sensitive display device 50 (i.e. OLED) on top isolation layer/ceramic barrier layer 42 by: forming a first electrically conductive layer on the isolation barrier layer 42; forming a functional organic layer 50 on the first electrically conductive layer 52; and forming a second electrically conductive layer 54 on the functional organic layer (see fig. 1b, [0063]). Graff does not explicitly teach forming the organic electrical device on the second ceramic barrier layer; however, it would have been within the level of ordinary skill in the art at the time of the invention to vary the number of barrier layers on the substrate in order to effectively guard against atmospheric contaminants without hindering the overall size of the device.

**Claim 26:** Graff teaches forming an encapsulation 56 over the second electrically conductive layer such that the functional organic layer is sealed from the environment by said encapsulation (see fig. 1b; [0063]).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff in light of Graff et al. (US 6,522,067).

**Claim 27:** Graff '210 teaches forming multiple ceramic layers/piles (i.e. third and fourth ceramic barrier layers) wherein at least one layer is plasma treated (i.e. modifying a second surface of a third ceramic barrier layer to introduce second nucleation sites on the surface of the third ceramic barrier layer). Graff '210, however, does not explicitly disclose an encapsulation comprising ceramic barrier layers.

Graff '067 teaches an encapsulated organic light emitting device whereby the barrier stacks 270 and 130 encapsulate the electrically conductive layer/functional organic layer and is comprised of several ceramic barrier layers in order to provide enhanced barrier protection (see fig. 2, col. 3, lines 32-48; col. 4,

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lines 8-30; col. 5, lines 29-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include Graff '067's ceramic barrier containing encapsulation in Graff '210's method in order to provide enhanced barrier protection.

6. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff '210 in light of Komada et al. (JP 2001-277420, machine translation).

**Claims 29-30:** Graff '210 teaches that the surface of the barrier oxide layer is modified to improve adhesion of subsequently deposited layers, but only expressly teaches plasma treatment to achieve this. Komada teaches a method of modifying barrier oxide layers to produce nucleation sites which improve adhesion of subsequently deposited layers by either plasma treatment or chemical treatment with an acid (¶¶ 0010, 0020, 0039). Thus, because Komada teaches that acid treatment can be used in place of plasma treatment to produce nucleation sites on a barrier oxide layer, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an acid treatment in place of a plasma treatment in the method of Graff '210 with the predictable expectation of success.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT VETERE whose telephone number is (571)270-1864. The examiner can normally be reached on Mon-Fri 9-6.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Vetere/  
Examiner, Art Unit 1712

/Michael Cleveland/  
Supervisory Patent Examiner, Art Unit 1712